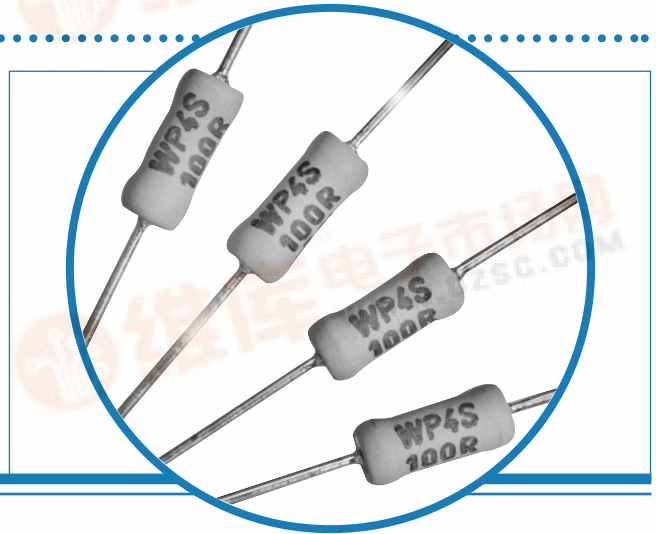


# Compact Flameproof Power Wirewound Resistors



## WP-S Series

- Small size for power rating
- Enhanced pulse handling capability
- Flameproof protection
- SMD Z-form available
- RoHS compliant with Pb-free terminations



## Electrical Data

|                            |         | WP1S                         | WP2S        | WP25S                | WP3S       | WP4S                     | WP5S                     | WP7S       |
|----------------------------|---------|------------------------------|-------------|----------------------|------------|--------------------------|--------------------------|------------|
| Power rating at 25°C       | watts   | 1                            | 2           | 2.5                  | 3          | 4                        | 5                        | 7          |
| 5s overload rating at 25°C | watts   | 5                            | 10          | 12.5                 | 15         | 20                       | 25                       | 35         |
| Short pulse performance    |         | See Pulse Performance graphs |             |                      |            |                          |                          |            |
| Resistance range           | ohms    | R068 to 430R                 | R05 to 900R | R05 to 900R          | R01 to 2K2 | R01 to 10K               | R015 to 6K8              | R15 to 10K |
| Limiting element voltage   | volts   | 50                           | 50          | 75                   | 100        | 100                      | 150                      | 150        |
| TCR                        | ppm/°C  |                              |             | <1R: 350    ≥1R: 200 |            |                          |                          |            |
| Isolation Voltage          | volts   | 250                          |             | 350                  |            | 500                      |                          | 700        |
| Resistance Tolerance       | %       | <20R: 5    ≥20R: 1, 2, 5     |             |                      |            | <R10: 5    ≥R10: 1, 2, 5 | <20R: 5    ≥20R: 1, 2, 5 |            |
| Standard Values            |         | E24 preferred                |             |                      |            |                          |                          |            |
| Thermal Impedance          | °C/watt | 140                          | 110         | 90                   | 82         | 62                       | 54                       | 35         |
| Ambient temperature range  | °C      | -55 to +155                  |             |                      |            |                          |                          |            |

## Physical Data

| Dimensions (mm) & Weight (g) |       |       |       |       |                   |                 |         |  |
|------------------------------|-------|-------|-------|-------|-------------------|-----------------|---------|--|
| Type                         | L max | D max | f min | d nom | PCB mount centres | Min bend radius | Wt. nom |  |
| WP1S                         | 6.2   | 2.8   | 21.20 | 0.6   | 10.20             | 0.6             | 0.22    |  |
| WP2S                         | 9.0   | 3.6   | 19.80 | 0.8   | 12.70             | 1.2             | 0.50    |  |
| WP25S                        | 12.5  | 4.5   | 17.80 |       | 18.40             |                 | 0.50    |  |
| WP3S                         | 14.5  | 5.2   | 24.55 |       | 20.30             |                 | 1.10    |  |
| WP4S                         | 13    | 5.6   | 22.75 |       | 18.90             |                 | 1.00    |  |
| WP5S                         | 16.5  | 7.0   | 23.55 |       | 22.86             |                 | 1.75    |  |
| WP7S                         | 25.0  | 8.8   | 28.30 |       | 31.40             |                 | 4.40    |  |

## Construction

A high purity ceramic substrate is assembled with interference fit end caps to which are welded the terminations. The resistive element is wound on the substrate and welded to the caps. Flameproof silicone cement coating is applied prior to marking with indelible ink. The components are then leadformed if required and packed.

### General Note

Welwyn Components reserves the right to make changes in product specification without notice or liability. All information is subject to Welwyn's own data and is considered accurate at time of going to print.



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## Terminations

Material: Hot tin dipped copper wire  
 Strength: The terminations meet the requirements of IEC 68.2.21  
 Solderability: The terminations meet the requirements of IEC 115-1 Clause 4.17.3.2

## Marking

WP1S, WP2S, WP25S and WP3S resistors R10 and above are marked with four or five colour bands in conformance with IEC62. Values below R10 are marked with three bands (two digits indicating value in milliohms, and tolerance); there is no multiplier band. WP4S, WP5S and WP7S resistors are legend marked with type reference, resistance value and tolerance.

## Solvent Resistance

The body protection and marking are resistant to all normal industrial cleaning solvents suitable for printed circuits.

## Flammability

The resistor coating will not burn or emit incandescent particles under any condition of applied temperature or power overload.

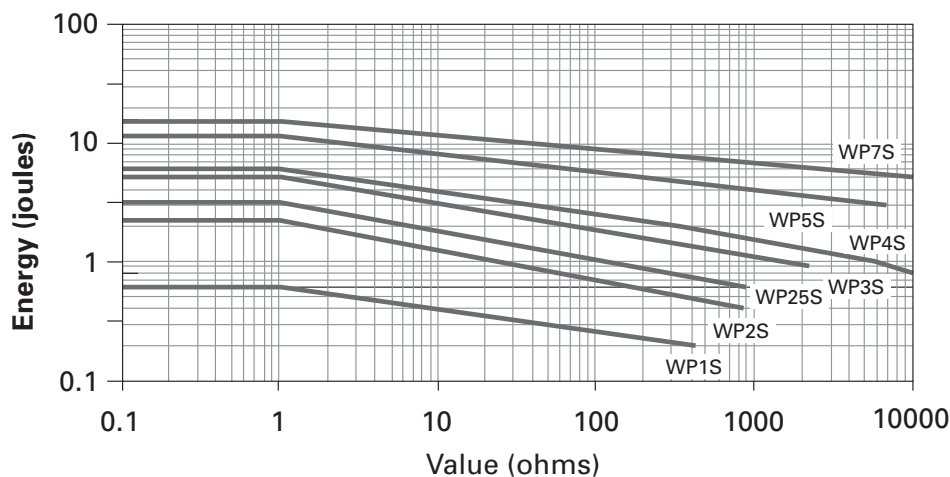
## Performance Data

|                                     |     | Maximum       | Typical Change |
|-------------------------------------|-----|---------------|----------------|
| Load at rated power: 1000hrs @ 25°C | ΔR% | 5 +0.001Ω     | 3              |
| Dry heat: 1000hrs @ 200°C           | ΔR% | 5 +0.001Ω     | 3              |
| Short term overload (5 x Pr for 5s) | ΔR% | 5 +0.001Ω     | 1              |
| Derating from rated power @25°C     |     | Zero at 280°C |                |
| Climatic                            | ΔR% | 5 +0.001Ω     | 2              |
| Climatic category                   |     | 55/200/56     |                |
| TRC & Vibration                     | ΔR% | 5 +0.001Ω     | 1              |
| Robustness & solder heat            | ΔR% | 5 +0.001Ω     | 1              |
| Long term damp heat (56 days)       | ΔR% | 5 +0.001Ω     | 1              |

## Pulse Performance

The pulse energy capacity limits in the graph below relate to pulses below 100ms duration, low mean power dissipation and at 25°C.

WP-S Short Pulse Energy Capacity



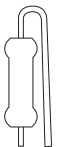
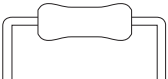
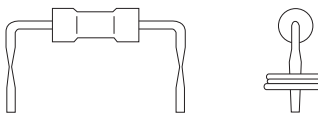
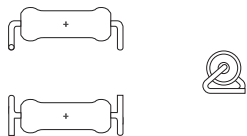
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WP-S Series



## Application Notes

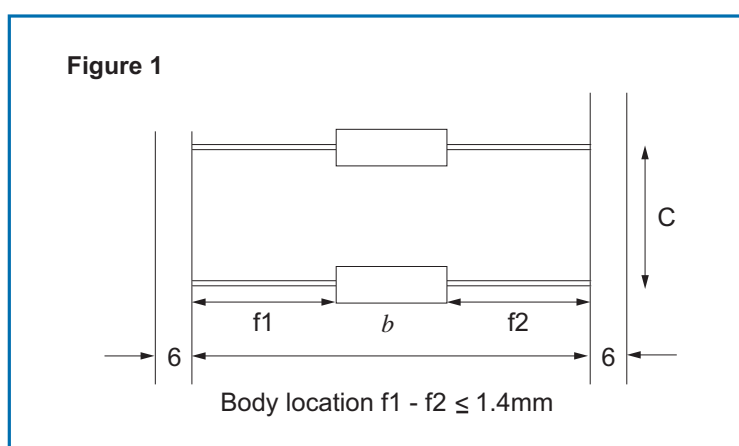
1. If the resistors are to dissipate full rated power, it is recommended that the terminations should not be soldered closer than 4mm from the body.
2. Due to operating temperature limits imposed by some PCB materials, derating may be necessary. An estimate of the temperature rise to be expected at the center of the body can be calculated using the thermal impedance figures given under Electrical Data.
3. WP-S resistors can also be supplied with radial, goalpost or lancet pre-formed leads. WP2S, WP3S, WP4S and WP5S are also available in an SMD format with Z formed leads and packed in blister tape. Consult factory for details.

| Radial   | Goalpost  | Lancet   | Z-form   |
|--|---|--|--|
|  |  |  |  |

## Packaging

The standard packaging for WP-S is taped. The critical dimensions are shown in Figure 1. The component wires will not protrude beyond the outside edge of the tapes. Taped product is then packed into boxes or onto reels; see Ordering Procedure for details. Alternative packaging is available by request. Pre-formed resistors are supplied loose packed in plastic bags or boxes.

| Dimensions (mm) | b  | c  |
|-----------------|----|----|
| WP1S            | 52 | 5  |
| WP2S            | 52 | 5  |
| WP25S           | 52 | 5  |
| WP3S            | 67 | 10 |
| WP4S            | 63 | 10 |
| WP5S            | 63 | 10 |
| WP7S            | 85 | 10 |



# Compact Flameproof Power Wirewound Resistors

WP-S Series



## Ordering Procedure

Example: WP2S at 680 ohms and 5% tolerance in ammo pack box of 2500 pieces -

Type ..... **WP2S** - **680R** **J** **A25**

Value (use IEC 62 code) .....

Tolerance (use IEC 62 code) .....

|   |    |
|---|----|
| F | 1% |
| G | 2% |
| J | 5% |

Packing .....

|      |      |       |          |          |
|------|------|-------|----------|----------|
| A5   | Ammo | WP1S  | 5000/box | Standard |
| A25  |      | WP2S  | 2500/box |          |
| A15  |      | WP25S | 1500/box |          |
| A1   |      | WP3S  | 1000/box |          |
| A1   |      | WP4S  | 1000/box |          |
| T075 | Tape | WP5S  | 700/reel |          |
| T07  |      | WP7S  | 700/reel |          |